

**Changes in the Composition of Labor
for BLS Multifactor Productivity Measures, 2004**

Characteristics of workers evolve over time and in response to changing labor market conditions. Each succeeding generation has completed more years of schooling than the one before. The large baby boom cohort entered middle age during the 1980s and 1990s, and is now a dominant force in the labor market. Consequently, middle-aged workers have come to account for an ever-larger share of total hours worked, and the average age of workers has risen. Furthermore, the longest economic expansion in U.S. history ended in the first quarter of 2001. The recession that followed had different impacts on young and old, men and women, and highly and less educated workers. As a result of these changes, the skill composition of hours worked, measured by a worker's education and experience, has varied considerably over time.

The BLS labor composition index estimates the effects that shifts in experience, education, and gender have on labor input growth and multifactor productivity growth. The Office of Productivity and Technology assembles data on workers' hours classified by their educational attainment, age and gender. Measures of labor input for private business and private nonfarm business are then calculated by summing the annual percent changes in each group's hours of work, each weighted by that group's share of total labor compensation. These BLS labor composition indices are reported annually in the Multifactor Productivity Trends news release. A complete description of these measures and methods can be found in Bulletin 2426, Labor Composition and U.S. Productivity Growth, 1948-90.

Recent Changes in Labor Composition

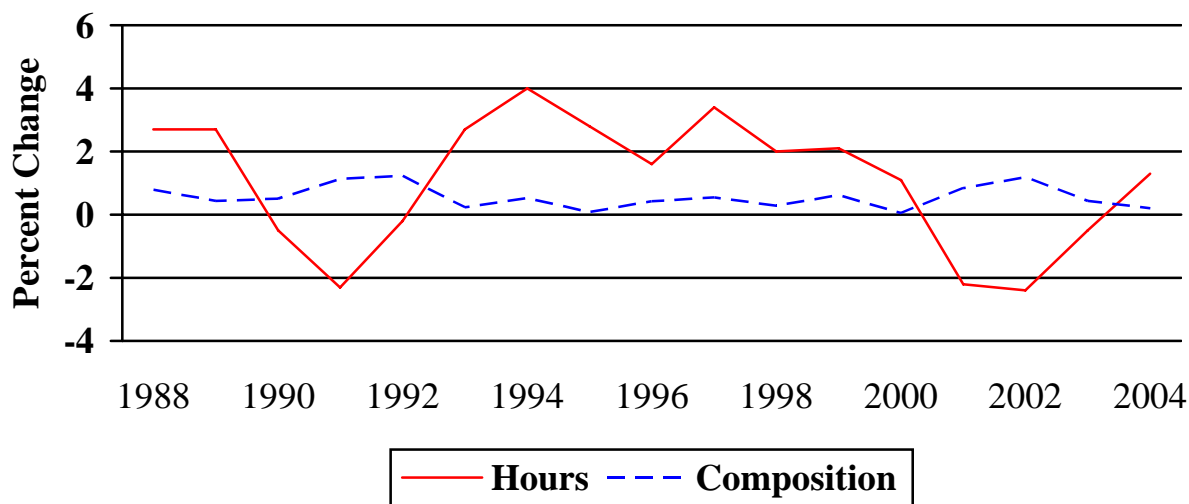
Based on data from the March 2004 and March 2005 Current Population Surveys (CPS) of households, the labor composition index for the 2002-2003 and 2003-2004 periods increased at the following rates:

| <u>Sector</u> | <u>2002-2003</u> | <u>2003-2004</u> |
|--------------------------|------------------|------------------|
| Private business | 0.4% | 0.2% |
| Private nonfarm business | 0.5% | 0.2% |

Charts 1 and 2 show annual changes in the index of labor composition and hours for the private business sector and the private nonfarm business sector from 1988-2004. The rates of growth for the private business and private nonfarm business sectors are very similar because the two sectors cover approximately the same portions of the economy. Private nonfarm business excludes hours in the farm sector from private business, and the farm sector comprises between 2 and 3 percent of the hours in the private business sector. Therefore changes in the composition of hours are virtually identical in the two sectors. For this reason, the private nonfarm business sector is not discussed further.

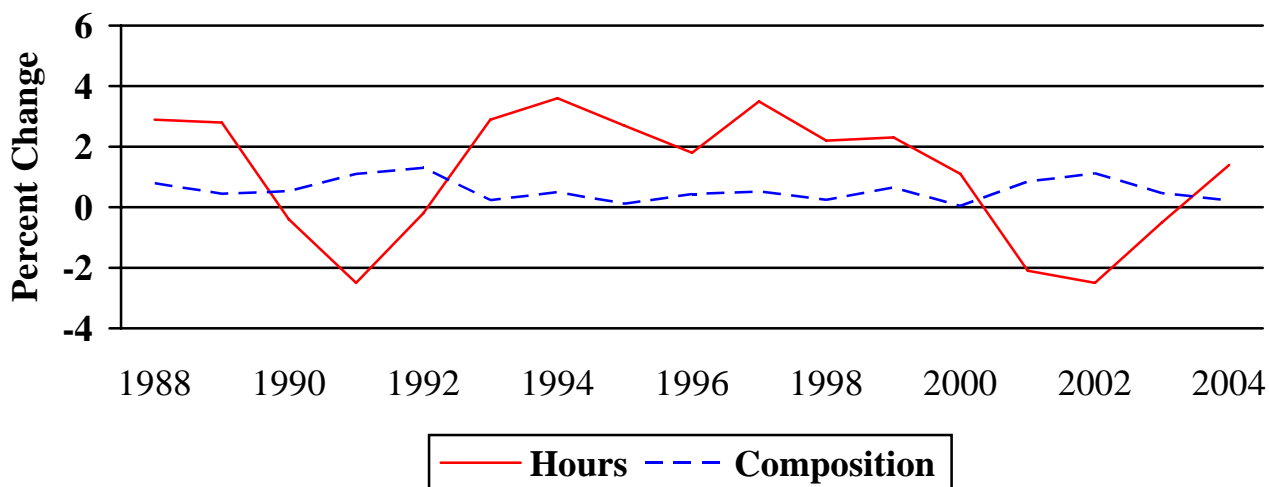
Table 1 (at the end of this document) divides the sources of labor input growth for the private business sector. While annual changes in labor input as measured by the Current Population Survey are usually dominated by changes in hours, labor composition growth generally provides a small but steady positive contribution to labor input. For the 1987-2004 period, labor composition in private business has accounted for 37.5 percent of the increase in labor input. Within a growth accounting framework, an increase in the labor composition index, in workers' skill levels, has the same effect on output and productivity growth as an increase in hours worked. Therefore, a 1-percent increase in labor composition is equivalent to a 1-percent increase in hours worked.

**Chart 1. Changes in the labor composition index
and hours in private business, 1988-2004**



Hours and labor composition are based on the March annual demographic file of the Current Population Survey.

Chart 2. Changes in the labor composition index and hours in private nonfarm business, 1988-2004



Hours and labor composition are based on the March annual demographic file of the Current Population Survey.

As can be seen in the charts above, cyclical effects also appear in the labor composition index. For example, during the 1990-1992 and 2001-2002 periods, labor composition index growth rates were greater than 1 percent. These periods coincide with economic recessions and the early stages of recovery from recession. During these periods, employment and hours declined. Since firms generally lay off workers with the least seniority, and blue collar workers usually experience more layoffs than well-educated white-collar workers do, the skills composition of the remaining work force increases. During a recovery, firms don't immediately start hiring employees; rather they wait for the economic expansion to mature. Therefore it is typical for an index of labor composition to increase relatively rapidly during recessions, and the beginnings of the recovery, and relatively slowly as economic expansions mature.

The role of experienced and highly educated workers within the current composition of the work force also can be seen in tables on employment, hours, and median weekly earnings that are published by broad age intervals in the Bureau of Labor Statistics publication Employment and Earnings¹.

Summary and Conclusions

In 2004, the labor composition index increased 0.2 percent for both private business and private nonfarm business. These gains were considerably lower than in 2003. This slowdown in the growth rate coincides with increases in the growth rate for hours. From 2001-2003, where we saw larger growth in labor composition; there was a decline in growth for hours. While the aging of the baby-boom generation and the

¹<http://www.bls.gov/cps/home.htm#empstat>. Employment Tables use 1-8, hours tables use 19 and 20, and for weekly earnings use tables 37-39.

increases in educational attainment added to labor composition growth in 2004, a relatively strong labor market reinforced a shift away from more educated and experienced workers.

Table 1. Sources of labor input growth in private business, 1988-2004

| (Percentage change) | | | |
|---|----------------------------|--------------------|-------------------|
| | | | |
| Year | Labor Input ^{1,2} | Hours ¹ | Labor Composition |
| 1988 | 3.5 | 2.7 | 0.8 |
| 1989 | 3.1 | 2.7 | 0.4 |
| | | | |
| 1990 | 0.0 | -0.5 | 0.5 |
| 1991 | -1.2 | -2.3 | 1.1 |
| 1992 | -0.8 | -0.2 | 1.2 |
| 1993 | 2.9 | 2.7 | 0.2 |
| 1994 | 4.5 | 4.0 | 0.5 |
| | | | |
| 1995 | 2.9 | 2.8 | 0.1 |
| 1996 | 2.0 | 1.6 | 0.4 |
| 1997 | 4.0 | 3.4 | 0.6 |
| 1998 | 2.3 | 2.0 | 0.3 |
| 1999 | 2.7 | 2.1 | 0.6 |
| | | | |
| 2000 | 1.2 | 1.1 | 0.1 |
| 2001 | -1.3 | -2.2 | 0.9 |
| 2002 | -1.2 | -2.4 | 1.2 |
| 2003 | -0.1 | -0.5 | 0.5 |
| 2004 | 1.5 | 1.3 | 0.2 |
| Long term Period | | | |
| 1987-2004 | 1.6 | 1.0 | 0.6 |
| 1. Labor input and hours growth rates are based on data from the Current Population Survey. | | | |
| These growth rates are not the measures used in the calculation of multifactor productivity. | | | |
| | | | |
| 2. The growth rate of labor input equals the growth rates of hours plus the growth rate in labor composition. | | | |
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